

Table S1 - Parameters

Spring Name	Sample #	Sample Date	Source	Latitude	Longitude	Temperature °C	pH	Conductivity
Tierra Amarilla								
North Highway	McG-NH-1	11/7/2013	This paper	35.544261	-106.830040	16	6.06	9840
North Highway	McG-NH-2	5/19/2014	This paper	35.544261	-106.830040	18.6	5.99	6430
North Highway	McG_NH_3	5/31/2014	This paper	35.544261	-106.830040	19.7	6.15	9250
North Highway-deep	McG-NH-4	6/30/2014	This paper	35.544261	-106.830040	20.18	6.01	9430
North Highway	McG_NH-5	7/18/2014	This paper	35.544261	-106.830040	21	5.88	9330
North Highway	McG_NH_6	9/1/2014	This paper	35.544261	-106.830040	22.8	6.07	9480
North Highway	McG_NH_7	10/24/2014	This paper	35.544261	-106.830040	18.6	5.87	9540
Twin Mound East	McG-TME-1	11/7/2013	This paper	35.536854	-106.847750	24.3	6.06	12340
Twin Mound East	McG-TME-2	5/19/2014	This paper	35.536854	-106.847750	23.8	6.02	8330
Twin Mound East	McG_TME-3	5/31/2014	This paper	35.536854	-106.847750	23.9	6.11	12610
Twine Mound East-deep	McG-TME-4	6/30/2014	This paper	35.536854	-106.847750	27.7	6.07	12560
Twin Mound East	McG_TME_5	7/18/2020	This paper	35.536854	-106.847750	24.5	5.89	12430
Twin Mound East	McG_TME_6	9/1/2014	This paper	35.536854	-106.847750	24.7	5.88	12610
Twin Mound East	McG_TME_7	10/24/2014	This paper	35.536854	-106.847750	24.3	5.95	12660
High Mound	McG_HM-1	11/7/2013	This paper	35.525767	-106.846447	16.7	6.08	15610
High Mound	McG_HM-2	5/19/2014	This paper	35.525767	-106.846447	nr	6.2	10300
High Mound	McG_HM-3	5/31/2014	This paper	35.525767	-106.846447	18.3	6.12	15330
High Mound-deep	McG_HM-4	6/30/2014	This paper	35.525767	-106.846447	22.2	6	16270
High Mound	McG_HM_5	7/18/2029	This paper	35.525767	-106.846447	19.7	6.06	15080
High Mound	McG_HM_6	9/1/2014	This paper	35.525767	-106.846447	20	5.85	15110
High Mound	McG_HM_7	10/24/2014	This paper	35.525767	-106.846447	18.4	5.89	15280
Grassy Spring	McG_GS-1	11/7/2013	This paper	35.518150	-106.844505	20.8	6.14	16280
Grassy Spring	McG_GS-2	5/19/2014	This paper	35.518150	-106.844505	20.7	5.97	10810
Grassy Spring	McG_GS-3	5/31/2014	This paper	35.518150	-106.844505	21.3	6.11	16240

Grassy Spring-deep	McG_GS-4	6/30/2014	This paper	35.518150	-106.844505	24.4	6.3	15330
Grassy Spring	McG_GS_5	7/18/2032	This paper	35.518150	-106.844505	22.1	6.05	16000
Grassy Spring	McG_GS_6	9/1/2014	This paper	35.518150	-106.844505	22.4	6.04	16120
Grassey Spring	McG_GS_7	10/24/2014	This paper	35.518150	-106.844505	21.2	5.88	16150
Rio Salado								
Rio Salado - north of TME	McG_RS-1	11/7/2013	This paper	35.541390	-106.843094	17.1	7.97	13580
Rio Salado - north of TME	McG_RS-2	5/19/2014	This paper	35.541390	-106.843094	18.6	7.76	9280
Rio Salado - north of TME	McG_RS1-3	5/31/2014	This paper	35.541390	-106.843094	19.4	8.17	13780
Rio Salado - by BLM gate	McG_RS2-3	5/31/2014	This paper	35.541390	-106.843094	21.3	7.83	13620
Rio Salado - north of TME	McG_RS_5	7/18/2017	This paper	35.541390	-106.843094	32.5	783	11850
Rio Salado - north of TME	McG_RS_6	10/24/2014	This paper	35.541390	-106.843094	17.9	7.86	11270
Penasco springs								
PS02Surface	PS02Surface	6/26/2014	This paper	35.597499	-106.864507	23.7	6.02	14470
PS2Deep	PS2Deep	6/26/2014	This paper	35.597499	-106.864507	nr	6.46	14090
JRPS09	JRPS06	6/26/2014	This paper	35.606835	-106.844909	23.6	6.63	10360
PS12Surface_BigMoma	PS12Surface	6/25/2014	This paper	35.621035	-106.873356	21.6	6.11	14420
PS12Deep_BigMoma	PS12Deep	6/28/2014	This paper	35.621035	-106.873356	nr	6.4	14370
PS12Spring_BigMoma	PS12Spring	6/25/2014	This paper	35.620640	-106.873760	20.7	6.12	14650
PS17Surface	PS17Surface	6/27/2014	This paper	35.612219	-106.871020	19.1	6.54	14650
PS17Deep	PS17Deep	6/27/2014	This paper	35.612219	-106.871020		6.53	14310
PS20	PS20	6/25/2014	This paper	35.619983	-106.873221	19.1	6.1	14830
PS21	PS21	6/25/2014	This paper	35.619518	-106.872956	nr	nr	nr
PS22	PS22	6/26/2014	This paper	35.590086	-106.865891	29	6.09	11600

PS23	PS23_1	6/26/2014	This paper	35.592116	-106.865210	27.3	6.22	12320
PS23	McG_PS23_2	9/1/2014	This paper	35.592116	-106.865210	27.1	6.18	12650
PS23	McG_PS23_3	10/24/2014	This paper	35.592116	-106.865210	26.2	5.97	12630
PS24	PS24	6/26/2014	This paper	35.592318	-106.864961	24.3	6.21	12580
Well	Kasemen Well	9/1/2014	This paper	35.645556	-106.888333	33.6	6.19	13520
Well	McG_KasemenWell_2	10/24/2014	This paper	35.645556	-106.888333	28.4	6.25	13500
Zia Well	Zia Well		This paper	35.645556	-106.888333	nr	nr	nr
Zia Well	LC11-Zia Warm Well	5/9/2011	This paper	35.645444	-106.889134	34	6.48	14870
White Spring	LC11-Zia White Spring	5/9/2011	This paper	3.563613	-106.521342	26.5	6.37	13920
BigMama	LC11-Zia-BigMama	5/9/2011	This paper	35.620650	-106.873789	21	6.21	7690
Zia Lake	LC11-ZiaLake		This paper	35.601660	-106.856071	20.2	6.81	11060
North Highway_2	A2	9/14/2024	Trainer 1978	35.543061	-106.833725	16.5	6.5	1400
North Highway	San Ysidro 11/North Highway	9/15/1924	Rennick 1931	35.544261	-106.830040	20	nr	nr
Twin Mound East	A3	12/20/1974	Trainer 1978	35.536854	-106.847750	25	nr	11200
Twin Mound East	BC- TWINE-09-08	5/2/2009	Cron 2011	35.536854	-106.847750	24.9	5.75	14530
Twin Mound East	BC- TWINE-09-12	5/2/2009	Cron 2011	35.536854	-106.847750	26.4	5.8	14200
Twin Mound East	LC07-SY-01	9/12/2007	Cron 2011	35.536854	-106.847750	25	6.25	15220
Twin Mound East	BC-MTEsurface-10-88	3/17/2010	Cron 2011	35.536854	-106.847750	24.2	6.94	14530
Twin Mound East	BC-MTE-09-65	8/29/2009	Cron 2011	35.536854	-106.847750	24.9	5.56	13770
Twin Mound East	BC-MTE-10-102	6/19/2010	Cron 2011	35.536854	-106.847750	25.2	6.19	12290
Twin Mound East	LC05-SY-100	11/20/2005	Cron 2011	35.536854	-106.847750	24.3	6.3	14260
Twin Mound East	BC11SY05	1/23/2011	Cron 2011	35.536854	-106.847750	24.4	5.9	14171
Twin Mound East	LC 06-NM-TAE-1a	6/16/2006	Cron 2011	35.535790	-106.847830	24.4	6.24	14830
Twin Mound East	LC05-SY-101	11/20/2006	Cron 2011	35.518150	-106.844505	19.6	6.26	17130
Twin Mound East Deep	LC 06-NM-TAE-1b	6/16/2006	Cron 2011	35.535790	-106.847830	24.5	6.18	15130
Twin Mound East Deep	BC-MTEdeep-10-80	3/17/2010	Cron 2011	35.536854	-106.847750	23.2	6.24	13820
Twin Mound East	San Ysidro 12	9/15/1924	Rennick 1931	35.536854	-106.847750	30	nr	nr
High Mound	A4	10/18/1974	Trainer 1978	35.525767	-106.846447	nr	nr	20000
High Mound	LC09TA0704	1/23/2011	Cron 2011	35.525767	-106.846447	17.6	6.08	19510

Grassy Spring	BC-grassy-09-26	5/2/2009	Cron 2011	35.518150	-106.844505	21.6	5.62	18280
Grassy Spring	BC-grassy-09-30	5/2/2009	Cron 2011	35.518150	-106.844505	21.6	5.62	18280
Grassy Spring	BC11SY03	1/23/2011	Cron 2011	35.518150	-106.844505	18.1	6.14	15940
Grassy Spring	BC-Grassy-09-56	8/29/2009	Cron 2011	35.518150	-106.844505	22.8	5.38	17340
Grassy Spring	BC-Grassy-10-103	6/19/2010	Cron 2011	35.518150	-106.844505	22.5	6.24	16400
Grassy Spring	A5	12/20/1974	Trainer 1978	35.518150	-106.844505	11	nr	12900
Bog	BC11SY01	1/23/2011	Cron 2011	35.530258	-106.847153	11.6	6.19	17470
BC- Iron-09-34	Iron spring	5/2/2009	Cron 2011	35.535390	-106.848060	20.4	6.38	16310
BC11SY02	Giant Mound/Fissure ridge	1/23/2011	Cron 2011	35.526675	-106.526675	11.7	6.12	16590
Rio Salado								
Rio Salado - north of TME	BCSY1107	2/19/2011	Cron 2011	35.541390	-106.843094	11.5	8.27	14110
Penasco springs								
Zia Well	Zia Well		LCJ	35.645556	-106.888333	nr	nr	nr
Kasemen Well	Warm Well1	09/xx/1979	Vautaz and Goff 1986	35.645556	-106.888333	nr	nr	nr
Kasemen Well	Warm Well2	04/xx/1980	Vautaz and Goff 1986	35.645556	-106.888333	nr	nr	nr
Kasemen Well	Warm Well3	02/xx/1983	Vautaz and Goff 1986	35.645556	-106.888333	nr	nr	nr
Zia Well	LC11-Zia Warm Well	5/9/2011	LCJ	35.645444	-106.889134	34	6.48	14870
White Spring	LC11-Zia White Spring	5/9/2011	LCJ	3.563613	-106.521342	26.5	6.37	13920
BigMama	LC11-Zia-BigMama	5/9/2011	LCJ	35.620650	-106.873789	21	6.21	7690
Zia Lake	LC11-ZiaLake		LCJ	35.601660	-106.856071	20.2	6.81	11060
Swimming Pool Spring	A6(PS06)	9/14/1924	Trainer 1978	35.597499	-106.864507	21	nr	nr
Zia Pueblo Spring	C1	10/2/1973	Trainer 1978	35.651363	-106.869778	nr	7.9	960
Zia Pueblo Well Chinle	C2	9/29/1926	Trainer 1978	35.617944	-106.880398	46	nr	nr

Zia Pueblo Warm Well Magdl	C3	12/2/1974	Trainer 1978	35.642253	-106.890071	52	6.8	157000
Zia Pueblo Ojito Spring	C4	6/5/1973	Trainer 1978	35.591574	-106.960931	21	8.5	10100
Zia Pueblo Cachana Spring	C5	7/xx/46	Trainer 1978	35.660904	-106.889720	nr	nr	1130
Log Spring	D4	5/23/1973	Trainer 1978	35.646980	-106.849666	15	7.6	450
Valles Caldera								
VC-1 (2 samples)	VA-209/238	Sept-1985 / May-1986	Vuataz et al., 1988	35.840833	-106.621944	125	nr	nr
Spence Hot Spring	VA-190	Jun-85	Vuataz et al., 1988 (parameters from Shevenell et al., 1987)	35.849444	-106.628889	41.6	7.87	275
Woman's bathhouse Spring	VA-186	Jun-85	Vuataz et al., 1988 (parameters from Shevenell et al., 1987)	35.908056	-106.615000	88	4.3	128000
Men's Bathhouse Spring	na	9/xx/1981	Vautaz and Goff 1986	35.907839	-106.616239	82	nr	nr
Sulphur Spring	na	9/xx/1981	Vautaz and Goff 1986	35.907839	-106.616239	16	nr	nr
VC-2A	na	9/27/1987	Goff et al., 1992	35.907839	-106.616239	nr	nr	nr
VC-2B	VC2B-90	1/17/1990	Goff et al., 1992	35.907839	-106.616239	nr	nr	nr
WC 23-4 sulfur springs (4800Feet)	VA-113	1/4/1983	Goff et al., 1988	35.907839	-106.616239	214	8.03	nr
Baca-4	BA-2	Jun-82	Shevenell et al., 1987 and references therein	35.888989	-106.571063	294	7.28	9100

Baca-4	BA-5	Jul-82	Shevenell et al., 1987 and references therein	35.888989	-106.571063	297	7.2	9100
Baca13	BA-1	Jun-82	Shevenell et al., 1987 and references therein, Vuataz et al., 1988 for Sr data	35.893178	-106.571111	278	7.3	8500
Baca13	BA-4	Jul-82	Shevenell et al., 1987 and references therein	35.893178	-106.571111	279	7.2	8900
Baca15	BA-7	Jul-82	Shevenell et al., 1987 and references therein	35.893333	-106.580000	267	7.61	10400
Baca15	BA-8	Sep-82	Shevenell et al., 1987 and references therein, Vuataz et al., 1988 for Sr data	35.893333	-106.580000	326	7.12	10600
Baca19	BA-9	Oct-82	Shevenell et al., 1987 and references therein	35.893333	-106.580000	223	8.45	10900
Baca24	BA-3	Jun-82	Shevenell et al., 1987 and references therein	35.886642	-106.576305	260	7.25	10600
Baca24	BA-6	Jul-82	Shevenell et al., 1987 and	35.886642	-106.576305	261	7.43	10400

			references therein					
Soda Dam Springs								
Soda Dam Main Spring	SDS	Jun-14	This study	35.792082	-106.686685	46.2	6.12	6600
Soda Dam Main Spring	LC16-SDS-1	Feb-16	This study	35.792082	-106.686685	45.5	6.18	6160
Soda Dam Main Spring	VA6	Jul-78	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	6.2	nr
Soda Dam Main Spring	VA9	Jan-79	Shevenell et al., 1987 and references therein	35.792082	-106.686685	48	6.4	7050
Soda Dam Main Spring	VA26	May-79	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	6.52	6600
Soda Dam Main Spring	VA51	Apr-80	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	6.35	5900
Soda Dam Main Spring	VA64	Dec-80	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	6.28	5600
Soda Dam Main Spring	VA70	Jun-81	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	6.28	6700
Soda Dam Main Spring	VA73	Oct-81	Shevenell et al., 1987 and	35.792082	-106.686685	47	6.3	6700

			references therein					
Soda Dam Main Spring	VA89	Mar-82	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	6.45	6700
Soda Dam Main Spring	VA99	Aug-82	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47.5	nr	6900
Soda Dam Main Spring	VA109	Jan-83	Shevenell et al., 1987 and references therein	35.792082	-106.686685	46.8	6.21	7090
Soda Dam Main Spring	VA132	May-83	Shevenell et al., 1987 and references therein	35.792082	-106.686685	47	7.19	6800
Soda Dam Main Spring	VA140	Feb-84	Shevenell et al., 1987 and references therein	35.792082	-106.686685	46.8	6.71	7300
Soda Dam Main Spring	VA146	Apr-84	Shevenell et al., 1987 and references therein	35.792082	-106.686685	nr	6.95	6700
Hidden Warm Spring	VA27	May-79	Shevenell et al., 1987 and references therein	35.792132	-106.686748	29	6.28	5700
Hidden Warm Spring	VA90	Mar-82	Shevenell et al., 1987 and references therein	35.792132	-106.686748	32	6.2	6000

Hidden Warm Spring	VA110	Jan-83	Shevenell et al., 1987 and references therein	35.792132	-106.686748	32.3	6.13	6150
Hidden Warm Spring	VA141	Feb-84	Shevenell et al., 1987 and references therein	35.792132	-106.686748	32.2	6.42	6260
Grotto Spring	VA-5	Jul-78	Goff et al., 1981	35.791812	-106.686090	38	6.8	nr
Main Spring H-6	na	Dec-72	Trainer et al., 2000 and references therein	35.792132	-106.686748	48	6.1	8000
Jemez Springs								
Jemez Springs	LC16-JS-1	02/13/16	This study	35.772038	-106.690775	69.1	6.52	3910
Main Jemez Spring	VA10	Jan-79	Shevenell et al., 1987 and references therein	35.772038	-106.690775	55.0	7.0	4200.0
Main Jemez Spring	VA18	Jan-79	Shevenell et al., 1987 and references therein	35.772038	-106.690775	36.0	7.5	4250.0
Main Jemez Spring	VA93	Mar-82	Shevenell et al., 1987 and references therein	35.772038	-106.690775	46.3	6.7	4270.0
Main Jemez Spring	VA122	Jan-83	Shevenell et al., 1987 and references therein	35.772038	-106.690775	74.9	6.6	4380.0

Main Jemez Spring	VA143	Feb-84	Shevenell et al., 1987 and references therein	35.772038	-106.690775	74.7	6.5	4460.0
Main Jemez Spring	VA147	Apr-84	Shevenell et al., 1987 and references therein	35.772038	-106.690775	nr	7.1	3900.0
Jemez Springs geothermal well	VA121	Jan-83	Shevenell et al., 1987 and references therein	35.773333	-106.688889	73.3	6.5	4280.0
Jemez Springs geothermal well	VA144	Feb-84	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.3	6.4	4670.0
Jemez Well/24m	VA19	Jan-79	Shevenell et al., 1987 and references therein	35.773333	-106.688889	68.0	6.6	3300.0
Jemez Well/24m	VA25	May-79	Shevenell et al., 1987 and references therein	35.773333	-106.688889	73.3	6.6	3500.0
Jemez Well/152m	VA15	Jan-79	Shevenell et al., 1987 and references therein	35.773333	-106.688889	60.5	6.7	1700.0
Jemez Well/152m	VA21	Feb-79	Shevenell et al., 1987 and references therein	35.773333	-106.688889	61.0	6.6	1830.0
Jemez Springs well	H-17	5/30/1974	Trainer et al., 2000 and	35.773333	-106.688889	58	7.1	3600

			references therein					
Travertine Mound Spring	VA7	Jan-79	Shevenell et al., 1987 and references therein	35.773333	-106.688889	70.0	6.3	4200.0
Travertine Mound Spring	VA17	Jan-79	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.0	6.7	4100.0
Travertine Mound Spring	VA66	Dec-80	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.0	6.7	3400.0
Travertine Mound Spring	VA71	Jun-81	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.0	6.1	3900.0
Travertine Mound Spring	VA91	Mar-82	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.3	6.5	4540.0
Travertine Mound Spring	VA123	Jan-83	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.6	6.6	4360.0
Travertine Mound Spring	VA142	Feb-84	Shevenell et al., 1987 and references therein	35.773333	-106.688889	72.9	6.2	4740.0
Travertine Mound Spring	H-14	12/2/1972	Trainer et al., 2000 and references therein	35.773333	-106.688889	75	6.3	3930

Buddhist Spring	VA-16	1/xx/1979	Shevenell et al., 1987 and references therein	35.773333	-106.688889	49	6.38	3300
Indian Springs								
Jemez Pueblo Well	LC16-JP-1	02/13/16	This study	35.792082	-106.686685	45.5	6.18	6160
Indian Spring (hot) 1	na		Witcher 1988	35.590202	-106.752000	36	6.91	3176
Indian Spring (hot) 2	na		Witcher 1988	35.590202	-106.752000	43	6.9	3572
Salt Spring	DN04-JP-12	5/9/2011	Newell et al., 2005 (isotope data from Shevenell et al., 87)	35.597751	-106.760470	17.5	7.43	11700
Owl Spring	JP OS	5/9/2011	Newell et al., 2005 (isotope data from Shevenell et al., 87)	35.628843	-106.763592	14.3	6.53	821
San Juan Basin								
Nutria Main	na	11/7/2007	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	
Nutria Cyn Wall	na	11/7/2007	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	

Lonjose SW	na	8/27/2009	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	
Sacred	na	5/7/2008	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	
Ojo Caliente Big	na	5/7/2008	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	
Rainbow	na	5/7/2008	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	
Plumasano Wash	na	5/8/2008	Drakos et al., 2013	See maps in Drakos et al., 2013 - Psg aquifer, San Andreas/Glorieta	nr	nr	nr	
3	na	12/3/1987	Dam 1995	Well, see map in Dam 1995 - Dakota Aquifer	32.7	8.6	nr	
8	na	4/29/1986	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	18.4	8.73	nr	
9	na	4/29/1986	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	18	9.1	nr	
13	na	6/11/1987	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	19.5	8.9	nr	
36	na	10/2/1987	Dam 1995	Well, see map in Dam 1995 - Morrison Aquifer	42.2	8.31	nr	
37	na	1/28/1972	Dam 1995	Well, see map in Dam 1995 - Morrison Aquifer	30.5	9.05	nr	
44	na	3/10/1970	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	nr	8.2	nr	
46	na	9/19/1962	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	nr	7.8	nr	

48	na	10/2/1962	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	24.5	8.2	nr	
49	na	7/18/1973	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	24	7.9	nr	
51	na	9/18/1962	Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	nr	8.1	nr	
52	na		Dam 1995	Well, see map in Dam 1995 - Gallup Aquifer	20	8.8	nr	
Jemez River								
EFJR	3/16/2011	3/16/2011	This paper	35.827432	3.6	7.25	6.74	117.8
Jemez River above Soda Dam	GT15-JRASD-19	9/12/2015	This paper	35.732850	-106.644070	21.9	6.74	255

nr – Not reported or recorded.

Table S2 – Major ion chemistry

Spring Name	Sample #	Ca	Mg	Na	K	Alkalinity	Cl	SO₄	Charge balance % error
Tierra Amarilla									
North Highway	McG-NH-1	284.9	61.0	1752.0	77.8	2083.1	1478.3	1080.5	-0.47
North Highway	McG-NH-2	258.9	59.3	1845.0	69.1	2023.3	1730.4	1082.3	-2.29
North Highway-deep	McG-NH-4	273.1	62.6	2175.1	76.2	1975.7	1656.9	1415.9	3.01
Twin Mound East	McG-TME-1	416.3	66.2	2576.0	86.4	2028.2	1853.8	2507.0	0.99
Twin Mound East	McG-TME-2	376.8	63.1	2564.9	75.8	1937.9	2237.7	2600.5	-4.02
Twine Mound East-deep	McG-TME-4	396.0	66.7	3063.5	84.0	2478.5	1944.3	2906.4	1.47
High Mound	McG_HM-1	488.2	104.0	3249.0	129.5	2546.8	2220.2	3544.1	-0.17
High Mound	McG_HM-2	444.9	99.9	3243.6	113.3	2511.5	2596.0	3657.3	-4.42
High Mound-deep	McG_HM-4	466.6	105.7	3567.9	125.0	2402.8	2573.1	3914.3	-0.81
Grassy Spring	McG_GS-1	509.5	119.4	3371.0	14.8	2489.5	2452.9	3947.7	-2.65
Grassy Spring	McG_GS-2	464.5	115.1	3800.7	147.9	2393.1	2774.9	4174.9	-0.66
Grassy Spring-deep	McG_GS-4	479.6	119.4	3863.0	154.6	1946.4	3107.4	4362.4	-1.11
Rio Salado									
Rio Salado - north of TME	McG_RS-1	395.4	77.3	2717.0	62.1	488.1	2005.1	3743.3	1.17
Rio Salado - north of TME	McG_RS-2	302.3	78.2	2883.7	61.2	500.3	2476.2	3963.6	-3.90
Penasco springs									
PS02Surface	PS02Surface	517.0	71.2	3605.7	117.2	2151.5	2303.9	3689.0	3.92

PS2Deep	PS2Deep	512.8	71.6	3567.2	115.9	2173.4	2362.3	3727.2	2.64
JRPS09	JRPS09	271.8	56.4	2394.1	60.3	1385.1	2007.8	1598.2	4.76
PS12Surface_BigMoma	PS12Surface	376.2	62.6	3612.8	87.8	1441.2	2700.9	3572.5	2.55
PS12Deep_BigMoma	PS12Deep	364.1	60.3	3633.4	85.5	1482.7	2701.7	3438.5	3.17
PS12Spring_BigMoma	PS12Spring	375.1	61.1	3609.6	88.1	1438.8	2643.9	3387.7	4.07
PS17Surface	PS17Surface	390.3	62.4	3662.3	96.4	1595.0	2477.9	3665.9	3.90
PS17Deep	PS17Deep	413.3	63.0	3632.1	99.3	1641.4	2480.9	3673.0	3.61
PS20	PS20	427.1	64.4	3670.1	98.1	1547.4	2696.9	3537.8	3.75
PS21	PS21	392.7	63.8	3679.0	92.8	1499.8	2744.5	3520.4	3.29
PS22	PS22	356.2	54.1	2791.6	88.8	1857.4	1972.6	2556.6	2.31
PS23	PS23_1	437.6	62.0	3168.0	104.9	2049.0	2114.6	3370.4	1.21
PS24	PS24	446.4	63.6	3232.9	105.0	2052.6	1954.5	2948.4	6.43
Tierra Amarilla									
North Highway	BC10-SY-North	244.7	51.1	2603.0	82.7	1952.5	2111.0	1952.5	-0.17
North Highway	BC-NORTH-10-02	267.8	60.5	2059.5	79.5	2196.6	2229.0	1146.0	-5.49
North Highway	LC04-SY-1	190.6	39.3	1068.9	164.6	195.3	1779.9	962.0	-7.29
North Highway	LC04-SY-1	268.5	71.3	1068.9	164.6	195.3	1779.9	962.0	-2.41
North Highway	DN04-SY-20	408.3	135.7	1696.5	156.1	1864.7	2147.4	1180.2	-2.84
North Highway	BC-North-10-92	287.6	44.7	2724.0	57.8	1958.6	2111.0	1236.0	8.07
North Highway	BC11SY06	205.9	59.0	1785.0	75.4	1958.6	1800.0	1050.0	-5.03
North Highway_2	A2	300.0	68.0	2000.0	81.0	1970.0	1900.0	1300.0	-1.49
San Ysidro 11/North Highway	San Ysidro 11/North Highway	368.0	85.0	2219.0	with Na	1757.0	1940.0	1712.0	1.12
Twin Mound East	A3	390.0	65.0	3000.0	91.0	1855.0	2400.0	2600.0	1.74
Twin Mound East	BC- TWINE-09-08	348.7	70.3	3339.0	112.5	1873.2	2794.0	3170.0	-1.22
Twin Mound East	BC- TWINE-09-12	307.4	57.5	3219.0	105.0	1848.8	3055.4	2895.0	-4.12
Twin Mound East	LC07-SY-01	388.4	71.2	2458.0	155.4	1913.5	1921.0	2946.3	-3.81
Twin Mound East	BC-MTEsurface-10-88	368.7	57.4	3219.0	92.9	1879.3	2490.4	2875.1	1.41
Twin Mound East	BC-MTE-09-65	340.4	58.8	3224.0	131.3	1793.9	2753.1	3104.0	-1.86

Twin Mound East	BC-MTE-10-102	417.2	67.1	4490.0	87.6	1879.3	3874.5	4073.1	-0.23
Twin Mound East	LC05-SY-100	315.5	78.8	3366.0	95.6	1922.0	2463.6	2719.8	4.09
Twin Mound East	BC11SY05	347.9	63.3	2593.0	72.3	1915.9	2325.0	2697.0	-5.49
Twin Mound East	LC 06-NM-TAE-1a	421.1	34.9	3103.0	85.0	1934.2	2181.5	2433.6	5.62
Twin Mound East	LC05-SY-101	260.3	130.6	4068.0	175.1	2196.6	3003.7	4048.4	0.03
Twin Mound East Deep	LC 06-NM-TAE-1b	426.3	34.9	3073.0	90.1	1848.8	2197.5	2452.5	5.52
Twin Mound East Deep	BC-MTEdeep-10-80	338.5	67.2	5585.0	88.1	1915.9	3220.0	3824.6	14.00
San Ysidro 12/Twin Mound East	San Ysidro 12/Twin Mound East	494.0	91.0	3310.0		1969.0	2500.0	3401.0	0.72
High Mound	LC09TA0704	372.3	93.2	3843.0	95.5	1830.1	2710.9	3800.0	2.69
Grassy Spring	BC-grassy-09-26	463.4	124.7	3840.0	221.9	2306.4	3669.7	4996.5	-8.70
Grassy Spring	BC-grassy-09-30	430.9	129.3	4044.0	199.5	2333.9	3229.8	4488.2	-2.22
Grassy Spring	BC11SY03	475.8	115.5	3479.0	152.0	2367.5	2548.0	3636.0	0.55
Grassy Spring	BC-Grassy-09-56	365.1	114.7	3943.0	203.7	2263.7	3198.0	4402.0	-3.45
Grassy Spring	BC-Grassy-10-103	282.0	111.0	3551.0	162.0	2355.3	2590.0	3650.0	-1.58
Grassy Spring	A5	220.0	110.0	3800.0	140.0	2260.0	2700.0	3700.0	-0.35
BC11SY01	Bog	557.8	114.1	3392.0	140.8	2330.8	2972.2	4518.0	-6.86
Iron spring	BC- Iron-09-34	661.6	474.0	3883.0	235.2	2419.3	3551.0	5509.0	-1.51
Giant Mound/Fissure ridge	BC11SY02	386.5	98.9	3184.0	119.5	2489.5	2692.0	3797.0	-7.35
Rio Salado									
Rio Salado	BCSY1107	331.2	72.5	287.1	62.1	493.6	842.9	336.8	-3.07
Penasco springs									
Kasemen Well	Warm Well1	nr	nr	nr	nr	1440.0	3000.0	3740.0	nr
Kasemen Well	Warm Well2	nr	nr	nr	nr	1068.0	3210.0	3430.0	nr
Kasemen Well	Warm Well3	nr	nr	nr	nr	1398.0	2984.0	3338.0	nr
Kasemen Well	LC11-Zia Warm Well	239.1	51.4	3582.0	82.7	1547.4	3035.0	2966.0	0.39
White Spring	LC11-Zia White Spring	452.6	64.7	3186.0	119.8	1939.7	2298.0	3370.0	0.82

BigMama	LC11-Zia-BigMama	382.2	64.7	3726.0	109.3	1372.9	3013.0	3801.0	0.70
Zia Lake	LC11-ZiaLake	279.9	54.8	2454.0	81.2	1307.0	2333.0	1698.0	1.88
A6(PS06)	Swimming Pool Spring	300.0	68.0	2000.0	81.0	1970.0	1900.0	1300.0	-1.49
C1	Zia Pueblo Spring	260.0	70.0	400.0	with Na	1301.0	2330.0	1728.0	nr
C2	Zia Pueblo Well Chinle	77.0	26.0	100.0	5.5	333.0	82.0	120.0	0.97
C3	Zia Pueblo Warm Well Magdl	400.0	73.0	450.0	with Na	1498.0	2660.0	3645.0	nr
C4	Zia Pueblo Ojito Spring	345.0	56.0	3550.0	87.0	1450.0	2990.0	3260.0	0.70
C5	Zia Pueblo Cachana Spring	120.0	9.0	2400.0	6.6	241.0	580.0	4500.0	-1.20
D4	Log Spring	44.0	10.0	210.0	with Na	470.0	82.0	91.0	nr
Valles Caldera									
VC-2A	na	5.9	0.1	1842.0	308.0	273.0	2943.0	55.0	-0.18
VC-2B	VC2B-90	78.5	0.8	2350.0	700.0	105.0	4150.0	7.8	2.12
WC 23-4 sulfur springs (4800 feet)	na	80.5	2.9	2800.0	470.0	360.0	4350.0	33.0	3.28
Baca-4	BA-2	3.7	0.0	1560.0	280.0	190.0	2670.0	49.0	-2.74
Baca-4	BA-5	3.6	0.0	1570.0	285.0	215.0	2640.0	49.0	-2.10
Baca13	BA-1	3.5	0.1	1550.0	255.0	221.0	2501.0	49.0	-0.71
Baca13	BA-4	4.3	0.2	1540.0	255.0	236.0	2594.0	47.0	-2.82
Baca15	BA-7	13.6	0.1	1950.0	330.0	89.0	3257.0	455.0	-4.50
Baca15	BA-8	14.2	0.1	1910.0	350.0	75.0	3302.0	37.0	-1.27
Baca19	BA-9	13.1	0.0	1920.0	310.0	139.0	3340.0	48.0	-2.84
Baca24	BA-3	17.2	0.1	1870.0	230.0	89.0	3151.0	48.0	-1.81
Baca24	BA-6	17.1	0.1	1850.0	235.0	90.0	3128.0	48.0	-1.89

Soda Dam Springs									
Soda Dam Main Spring	SDS	282.7	27.1	1024.0	157.5	1564.5	1443.9	38.0	-1.71
Soda Dam	LC16-SDS-1	319.6	23.4	1062.1	190.9	1808.5	1612.9	34.1	-4.76
Soda Dam Main Spring	VA6	328.0	26.0	1010.0	174.0	886.0	1480.0	37.0	7.95
Soda Dam Main Spring	VA9	340.0	24.4	938.0	183.0	1510.0	1500.0	38.4	-2.58
Soda Dam Main Spring	VA26	429.0	21.4	920.0	177.0	1490.0	1460.0	49.4	0.80
Soda Dam Main Spring	VA51	314.0	24.0	990.0	183.0	1000.0	1520.0	39.1	4.23
Soda Dam Main Spring	VA64	300.0	25.0	825.0	120.0	1250.0	1560.0	36.1	-7.64
Soda Dam Main Spring	VA70	331.0	23.8	860.0	170.0	1390.0	1480.0	41.0	-4.10
Soda Dam Main Spring	VA73	346.0	54.6	840.0	186.0	1500.0	1570.0	36.7	-4.96
Soda Dam Main Spring	VA89	nr	nr	nr	nr	1490.0	1480.0	35.5	nr
Soda Dam Main Spring	VA99	nr	nr	nr	nr	1455.0	1614.0	37.5	nr
Soda Dam Main Spring	VA109	245.0	17.4	1030.0	160.0	1458.0	1536.0	34.0	-4.13
Soda Dam Main Spring	VA132	315.0	22.7	980.0	186.0	1488.0	1477.0	35.0	-1.38
Soda Dam Main Spring	VA140	342.0	21.9	960.0	160.0	1488.0	1418.0	34.0	-0.29
Soda Dam Main Spring	VA146	nr	nr	nr	nr	1476.0	1567.0	35.0	nr
Hidden Warm Spring	VA27	376.0	18.8	720.0	141.0	1400.0	1195.0	69.1	-2.53
Hidden Warm Spring	VA90	nr	nr	nr	nr	1370.0	1240.0	48.3	nr
Hidden Warm Spring	VA110	226.0	15.3	817.0	130.0	1324.0	1294.0	53.0	-7.14
Hidden Warm Spring	VA141	305.0	20.0	780.0	125.0	1425.0	1240.0	49.0	-4.73
Grotto Spring	VA-5	324.0	27.0	1000.0	174.0	834.0	1480.0	41.0	8.21
Main Spring H-6		330.0	24.0	990.0	200.0	1578.0	1500.0	52.0	-1.94
Jemez Springs									
Jemez Springs	LC16-JS-1	116.8	4.0	712.2	77.1	827.4	960.8	34.9	-2.84
Main Jemez Spring	VA10	153.0	5.4	656.0	74.2	711.0	904.0	40.9	0.66
Main Jemez Spring	VA18	115.0	4.5	690.0	74.0	699.0	968.0	45.4	-2.18
Main Jemez Spring	VA93	nr	nr	nr	nr	720.0	926.0	45.5	nr

Nutria Main	na	79.0	18.0	9.2	1.0	317.0	5.9	43.0	-3.38
Nutria Cyn Wall	na	75.0	21.0	11.0	1.0	293.0	6.2	64.0	-2.74
Lonjose SW	na	92.0	26.0	7.8	0.1	390.0	4.0	23.0	0.62
Sacred	na	130.0	38.0	49.0	4.6	342.0	34.0	280.0	-2.19
Ojo Caliente Big	na	160.0	39.0	51.0	4.7	329.0	34.0	280.0	5.25
Rainbow	na	130.0	41.0	53.0	5.3	341.0	329.0	280.0	-25.45
Plumasano Wash	na	110.0	13.0	27.0	2.6	390.0	341.0	310.0	-48.46
3	na	7.0	1.2	669.0	2.3	240.0	81.0	1000.0	4.53
8	na	5.2	2.0	630.0	2.4	252.0	23.0	1200.0	-3.25
9	na	1.4	0.0	129.0	0.8	259.0	4.3	31.0	6.45
13	na	2.3	1.1	700.0	1.7	390.0	85.0	910.0	5.06
36	na	12.0	0.1	359.0	2.1	190.0	14.0	560.0	3.52
37	na	1.4	0.3	200.0	0.9	308.0	6.5	150.0	2.70
44	na	12.0	4.8	120.0	2.0	156.0	4.9	140.0	5.51
46	na	80.0	26.0	87.0	5.0	270.0	8.9	260.0	-0.23
48	na	9.5	2.1	720.0	3.0	310.0	42.0	1200.0	1.25
49	na	9.4	5.0	360.0	3.0	280.0	12.0	560.0	0.08
51	na	100.0	36.0	180.0	3.1	210.0	7.1	580.0	0.45
52	na	3.1	1.0	400.0	1.8	350.0	73.0	440.0	2.09
Jemez River									
EFJR	Jemez River East Fork	7.4	1.8	12.1	2.4	52.5	4.0	2.9	3.40

All values are reported in ppm, nr – not reported, na – not applicable

Table S3 – Stable isotopes

Sample Name	Sample #	Location	δD ‰	$\delta^{18}\text{O}$ ‰
Tierra Amarilla				
North Highway	McG-NH-1	Tierra Amarilla	-84.88	-10.18
North Highway	McG-NH-2	Tierra Amarilla	-83.47	-9.60
North Highway	McG_NH_3	Tierra Amarilla	-82.00	-9.38
North Highway	McG-NH-4	Tierra Amarilla	-85.23	-10.01
North Highway	McG_NH-5	Tierra Amarilla	-85.34	-9.99
North Highway	McG_NH_6	Tierra Amarilla	-86.47	-10.11
North Highway	McG_NH_7	Tierra Amarilla	-83.32	-9.01
Twin Mound East	McG-TME-1	Tierra Amarilla	-87.87	-11.28
Twin Mound East	McG-TME-2	Tierra Amarilla	-86.95	-10.89
Twin Mound East	McG_TME-3	Tierra Amarilla	-85.26	-10.72
Twin Mound East	McG-TME-4	Tierra Amarilla	-87.82	-10.95
Twin Mound East	McG_TME_5	Tierra Amarilla	-89.12	-11.07
Twin Mound East	McG_TME_6	Tierra Amarilla	-89.64	-11.27
Twin Mound East	McG_TME_7	Tierra Amarilla	-87.95	-10.28
High Mound	McG_HM-1	Tierra Amarilla	-84.59	-10.30
High Mound	McG_HM-2	Tierra Amarilla	-82.04	-9.45
High Mound	McG_HM-3	Tierra Amarilla	-81.71	-9.82
High Mound	McG_HM-4	Tierra Amarilla	-82.04	-9.34
High Mound	McG_HM_5	Tierra Amarilla	-84.84	-10.21
High Mound	McG_HM_6	Tierra Amarilla	-83.75	-9.70
High Mound	McG_HM_7	Tierra Amarilla	-84.98	-8.85
Grassy Spring	McG_GS-1	Tierra Amarilla	-82.93	-10.09
Grassy Spring	McG_GS-2	Tierra Amarilla	-81.71	-9.77
Grassy Spring	McG_GS-3	Tierra Amarilla	-83.87	-10.08
Grassy Spring	McG_GS-4	Tierra Amarilla	-84.10	-10.00

Grassy Spring	McG_GS_5	Tierra Amarilla	-84.22	-9.86
Grassy Spring	McG_GS_6	Tierra Amarilla	-83.37	-10.07
Grassy Spring	McG_GS_7	Tierra Amarilla	-83.91	-9.47
Penasco springs				
PS02Surface	PS02Surface	Penasco Springs	-87.37	-10.61
PS2Deep	PS2Deep	Penasco Springs	-87.73	-10.62
JRPS09	JRPS09	Penasco Springs	-86.35	-10.79
PS12Surface_BigMoma	PS12Surface	Penasco Springs	-88.98	-11.30
PS12Deep_BigMoma	PS12Deep	Penasco Springs	-90.75	-11.45
PS12Spring_BigMoma	PS12Spring	Penasco Springs	-89.88	-11.21
PS17Surface	PS17Surface	Penasco Springs	-88.55	-11.04
PS17Deep	PS17Deep	Penasco Springs	-88.67	-10.78
PS20	PS20	Penasco Springs	-87.11	-10.53
PS21	PS21	Penasco Springs	-84.87	-10.19
PS22	PS22	Penasco Springs	-90.69	-11.44
PS23	PS23_1	Penasco Springs	-89.47	-11.14
PS23_2	McG_PS23_2	Penasco Springs	-88.57	-10.56
PS23_3	McG_PS23_3	Penasco Springs	-88.22	-9.96
PS24	PS24	Penasco Springs	-86.40	-10.53
Kasemen Well	Kasemen Well	Penasco Springs	-86.50	-10.83
Kasemenr Well_2	McG_KasemenWell_2	Penasco Springs	-88.03	-10.52
Zia Well		Penasco Springs	-85.31	-11.11
Rio Salado				
Rio Salado	McG_RS-1	Tierra Amarilla	-72.33	-8.78
Rio Salado	McG_RS-2	Tierra Amarilla	-68.12	-7.08
Rio Salado	McG_RS1-3	Tierra Amarilla	-76.36	-9.10
Rio Salado	McG_RS_5	Tierra Amarilla	-70.12	-8.20

Rio Salado	McG_RS2-3	Tierra Amarilla	-69.60	-8.15
Rio Salado	McG_RS_6	Tierra Amarilla	-71.73	-7.97
Tierra Amarilla				
Twin Mound East	A3	Tierra Amarilla	-90.10	-11.20
Twin Mound East	BC- TWINE-09-08	Tierra Amarilla	-88.11	-11.00
Twin Mound East	BC- TWINE-09-12	Tierra Amarilla	-87.10	-11.06
Twin Mound East	BC-MTE-09-65	Tierra Amarilla	-88.88	-11.12
Twin Mound East	BC11SY05	Tierra Amarilla	-88.85	-10.99
Twin Mound West	BC- TWINW-09-04	Tierra Amarilla	-87.09	-11.08
High Mound	BC11SY02	Tierra Amarilla	-85.02	-10.18
High Mound	BC- Giant-09-20	Tierra Amarilla	-84.94	-10.19
High Mound	LC09TA0704 HM	Tierra Amarilla	-85.01	-10.15
Grassy Spring	BC-grassy-09-26	Tierra Amarilla	-83.60	-10.05
Grassy Spring	BC-grassy-09-30	Tierra Amarilla	-83.55	-10.06
Grassy Spring	BC11SY03	Tierra Amarilla	-84.66	-10.09
Grassy Spring	BC-Grassy-09-56	Tierra Amarilla	-83.41	-10.06
Grassy Spring	A5	Tierra Amarilla	-85.60	-10.01
North Highway_2	A2	Tierra Amarilla	-86.50	-10.12
Penasco springs				
C3		Penasco Springs	-90.60	-10.99
Zia Well	LC11-Zia Warm Well	Penasco Springs	-88.15	-10.70
White Spring	LC11-Zia White Spring	Penasco Springs	-88.69	-10.78
BigMama	LC11-Zia-BigMama	Penasco Springs	-89.87	-11.05
Zia Lake	LC11-ZiaLake	Penasco Springs	-87.45	-11.05
Kasemen Well	Warm Well1	Penasco Springs	-89.90	-11.25
Kasemen Well	Warm Well2	Penasco Springs	-89.00	-12.55

Valles Caldera

Men's Bathhouse Spring		Sulphur Spring	-47.10	-3.65
Sulphur Spring		Sulphur Spring	-72.90	-9.75
VC-2A		Sulphur Spring	-74.40	-7.10
VC-2B	VC2B-90	Sulphur Spring	-85.20	-7.50
WC 23-4 sulfur springs (4800 feet deep)	VA-113	Sulphur Spring	-80.40	-7.80
Baca-4		Redondo Creek	-86.00	-9.97
Baca-13		Redondo Creek	-85.00	-9.83
Baca-15		Redondo Creek	-84.00	-8.70
Baca-24		Redondo Creek	-82.10	-8.62
Baca-4	BA-2	Redondo Creek	-86.00	-10.40
Baca-4	BA-5	Redondo Creek	-86.50	-9.20
Baca13	BA-1	Redondo Creek	-97.00	-9.30
Baca13	BA-4	Redondo Creek	-85.00	-9.20
Baca15	BA-7	Redondo Creek	-82.50	-8.00
Baca15	BA-8	Redondo Creek	-85.00	-8.20
Baca19	BA-9	Redondo Creek	-80.00	-7.60
Baca24	BA-3	Redondo Creek	-83.50	-8.00
Baca24	BA-6	Redondo Creek	-83.50	-8.15

Soda Dam Springs

Soda Dam	LC16-SDS-1	Soda Dam Springs	-10.84	-83.30
Soda Dam Main Spring	VA6	Soda Dam Springs	-84.90	-10.60
Soda Dam Main Spring	VA51	Soda Dam Springs	-85.40	-10.70
Soda Dam Main Spring	VA64	Soda Dam Springs	-85.20	-10.60
Soda Dam Main Spring	VA109	Soda Dam Springs	-84.50	-10.35
Hidden Warm Spring	VA27	Soda Dam Springs	-84.90	-10.95

Hidden Warm Spring	VA90	Soda Dam Springs	-85.10	-10.65
Grotto Spring	VA-5	Soda Dam Springs	-84.60	-10.65
Jemez Springs				
Jemez Springs	LC16-JS-1	Jemez Springs	-11.16	-82.30
Main Jemez Spring	VA10	Jemez Springs	-82.30	-10.60
Main Jemez Spring	VA18	Jemez Springs	-81.40	-10.40
Main Jemez Spring	VA93	Jemez Springs	-82.10	-10.40
Main Jemez Spring	VA122	Jemez Springs	nr	nr
Main Jemez Spring	VA143	Jemez Springs	nr	nr
Main Jemez Spring	VA147	Jemez Springs	nr	nr
Jemez Springs geothermal well	VA121	Jemez Springs	nr	nr
Jemez Springs geothermal well	VA144	Jemez Springs	nr	nr
Jemez Well/24m	VA19	Jemez Springs	-84.00	-11.30
Jemez Well/24m	VA25	Jemez Springs	nr	nr
Jemez Well/152m	VA15	Jemez Springs	-85.90	-11.80
Jemez Well/152m	VA21	Jemez Springs	nr	nr
Jemez Springs well	H-17	Jemez Springs	-85.20	-11.42
Travertine Mound Spring	VA7	Jemez Springs	-83.60	-11.30
Travertine Mound Spring	VA17	Jemez Springs	nr	nr
Travertine Mound Spring	VA66	Jemez Springs	-83.10	-11.35
Travertine Mound Spring	VA71	Jemez Springs	nr	nr
Travertine Mound Spring	VA91	Jemez Springs	nr	nr
Travertine Mound Spring	VA123	Jemez Springs	nr	nr
Travertine Mound Spring	VA142	Jemez Springs	nr	nr
Travertine Mound Spring	H-14	Jemez Springs	-82.10	-10.52
Buddhist Spring	VA-16	Jemez Springs	-83.60	-11.05
Indian Springs				

Jemez Pueblo Well	LC16-JP-1	Jemez Pueblo	-86.10	-11.85
Salt Spring	na	Jemez Pueblo	-84.90	-10.20
Owl Spring	na	Jemez Pueblo	-86.20	-12.15
San Juan Basin				
Nutria Main	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-91.00	-12.60
Nutria Cyn Wall	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-85.00	-11.50
Lonjose SW	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-92.00	-12.60
Sacred	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-74.00	-10.40
Ojo Caliente Big	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-74.00	-10.50
Rainbow	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-75.80	-10.60
Plumasano Wash	na	Psg aquifer, San Andreas/Glorieta San Juan Basin	-69.00	-9.50
3	na	San Juan Basin	-110.00	-14.30
8	na	San Juan Basin	-97.00	-13.00
9	na	San Juan Basin	-87.00	-11.80
13	na	San Juan Basin	-96.00	-13.00
36	na	San Juan Basin	-108.00	-14.40
37	na	San Juan Basin	-108.00	-14.50
Jemez River				
EFJR	East Fork Jemez River	Jemez River	-88.00	-12.40

nr – not reported

Table S4 – trace elements

Spring Name	Sample #	Li	B	Br	Si	Sr	si_Calcite	si_Dolomite	si_Gypsum	si_CO₂(g)
Tierra Amarilla										
North Highway	McG-NH-1	5.16	9.82	5.41	7.50	0.02	nr	nr	nr	nr
North Highway	McG-NH-2	5.48	10.10	2.69	7.36	4.18	nr	nr	nr	nr
North Highway	McG-NH-4	0.10	0.24	4.29	0.05	0.15	-0.27	-0.89	-0.57	0.16
Twin Mound East	McG-TME-1	4.48	6.32	4.20	6.04	7.34	nr	nr	nr	nr
Twin Mound East	McG-TME-2	4.42	6.33	1.39	5.87	6.21	nr	nr	nr	nr
Twine Mound East-deep	McG-TME-4	8.36	10.57	4.36	9.92	11.64	0.03	-0.34	-0.28	0.23
High Mound	McG_HM-1	5.71	7.18	5.37	6.18	9.07	nr	nr	nr	nr
High Mound	McG_HM-2	5.69	6.91	2.47	5.96	7.66	nr	nr	nr	nr
High Mound-deep	McG_HM-4	8.19	9.33	5.29	8.06	11.15	-0.09	-0.52	-0.14	0.24
Grassy Spring	McG_GS-1	5.60	6.82	5.64	5.72	0.04	nr	nr	nr	nr
Grassy Spring	McG_GS-2	5.53	6.60	2.24	5.47	8.78	nr	nr	nr	nr
Grassy Spring	McG_GS-4	9.43	10.32	10.82	8.49	14.36	0.14	0.02	-0.11	-0.14
Rio Salado										
Rio Salado - north of TME	McG_RS-1	4.45	5.96	3.82	6.59	7.40	nr	nr	nr	nr
Rio Salado - north of TME	McG_RS-2	4.93	6.69	1.18	7.36	6.33	nr	nr	nr	nr

Penasco springs

Penasco Springs	PS02Surface	6.80	8.64	4.81	7.44	6.32	-0.05	-0.62	-0.11	0.18
Penasco Springs	PS2Deep	6.46	11.05	4.66	8.12	4.62	0.41	0.31	-0.11	-0.24
Penasco Springs	JRPS09	4.53	6.25	4.07	16.89	6.30	0.23	0.11	-0.54	-0.6
Penasco Springs	PS12Surface	7.93	9.83	4.29	10.63	9.48	-0.28	-1.03	-0.22	-0.09
Penasco Springs	PS12Deep	7.66	9.55	4.22	10.34	8.54	0.06	-0.32	-0.26	-0.35
Penasco Springs	PS12Spring	7.71	10.09	4.11	10.88	9.36	-0.27	-1.04	-0.23	-0.1
Penasco Springs	PS17Surface	9.58	11.69	3.94	10.13	10.41	0.17	-0.17	-0.19	-0.49
Penasco Springs	PS17Deep	9.48	11.68	4.08	10.17	10.33	0.27	0.08	-0.19	-0.43
Penasco Springs	PS20	8.89	11.06	4.18	7.09	10.21	-0.23	-1.01	-0.17	-0.06
Penasco Springs	PS21	8.74	10.81	4.25	7.41	10.46	0.69	0.93	-0.22	-0.94
Penasco Springs	PS22	8.95	10.83	4.08	19.22	8.43	-0.07	-0.58	-0.33	0.1
Penasco Springs	PS23_1	10.00	12.41	4.25	15.27	9.55	0.12	-0.24	-0.19	-0.01
Penasco Springs	PS24	10.40	12.59	4.29	14.61	10.12	0.11	-0.3	-0.21	-0.02

Tierra Amarilla

North Highway	BC-North-10-92	5.58	10.16	5.01	7.25		-0.25	-0.96	-0.52	-0.06
Twin Mound East	BC- TWINE-09-08	6.01	6.64	3.93	6.55	7.50	-0.43	-1.2	-0.31	0.49
Twin Mound East	BC- TWINE-09-12	9.10	6.78	4.63	7.09	6.29	-0.41	-1.18	-0.39	0.45
Twin Mound East	BC-MTEsurface-10-88	4.81	5.37	4.50		6.80	0.79	1.11	-0.3	-0.7
Twin Mound East	BC-MTE-09-65	3.17	5.74	9.46	5.32	7.10	-0.64	-1.7	-0.32	0.67
Twin Mound East Deep	BC-MTEdeep-10-80	4.65	5.07	5.13	4.18	6.73	0	-0.37	-0.33	-0.01
Giant mound/fissure ridge	BC- Giant-09-20	8.50	10.03	4.94	11.10	9.05	0.32	0.54	-0.22	-0.18
Grassy Spring	BC-grassy-09-26	7.61	6.76	5.18	5.96	11.00	-0.46	-1.19	-0.1	0.68
Grassy Spring	BC-grassy-09-30	7.91	8.27	5.56	7.24	11.00	-0.47	-1.16	-0.16	0.69
Grassy Spring	BC-Grassy-09-56	3.89	5.39	7.40	4.47	10.00	-0.78	-1.74	-0.23	0.93
Rio Salado										
Rio Salado	Rio Salado	6.59	5.96	nr	nr	nr	nr	nr	nr	nr
Rio Salado	Rio Salado	7.36	6.69	nr	nr	nr	nr	nr	nr	nr
Penasco springs										
Penasco Springs	LC11-Zia Warm Well	3.83	11.17	nr	nr	nr	nr	nr	nr	nr

Penasco Springs	LC11-Zia White Spring	6.90	13.78	4.03	nr	nr	nr	nr	nr	nr
Penasco Springs	LC11-Zia-BigMama	6.26	13.16	1.04	nr	nr	nr	nr	nr	nr
Penasco Springs	LC11-ZiaLake	3.87	4.96	3.66	nr	nr	nr	nr	nr	nr
Valles Caldera										
Sulfur Spring	WC 23-4 sulfur springs	37.40	39.30	nr	nr	nr	nr	nr	nr	nr
Baca-4	BA-2	20.00	20.00	4.10	720	nr	nr	nr	nr	nr
Baca-4	BA-5	20.6	nr	7.8	760	0.1	nr	nr	nr	nr
Baca13	BA-1	24.7	18.6	7	640	0.21	nr	nr	nr	nr
Baca13	BA-4	20.5	18	7.01	680	0.22	nr	nr	nr	nr
Baca15	BA-7	23.1	25.4	9.59	680	0.25	nr	nr	nr	nr
Baca15	BA-8	24.3	25	9.2	689	0.23	nr	nr	nr	nr
Baca19	BA-9	25.6	26.8	10.85	565	0.3	nr	nr	nr	nr
Baca24	BA-3	23.2	26.3	9.36	620	0.111	nr	nr	nr	nr
Baca24	BA-6	23.2	26.5	9.42	600	0.12	nr	nr	nr	nr
Soda Dam Springs										
Soda Dam Main Spring	SDS	14.38	13.44	4.46	21.15	1.42	0.25	0	-1.94	0.14
Soda Dam Main Spring	LC16-SDS-1	15.25387	13.72	14.49	20.74319	1.355981	nr	nr	nr	nr
Soda Dam Main Spring	VA6	13.2	11.50	nr	43	1.38	nr	nr	nr	nr
Soda Dam Main Spring	VA9	13.2	13.80	nr	50	1.5	nr	nr	nr	nr

Soda Dam Main Spring	VA26	13.6	12.80	nr	46	2.2	nr	nr	nr	nr
Soda Dam Main Spring	VA51	13.5	15.00	3.84	46	0.889	nr	nr	nr	nr
Soda Dam Main Spring	VA64	13.7	13.90	6.70	44	1.48	nr	nr	nr	nr
Soda Dam Main Spring	VA70	13.5	13.40	5.60	47	0.56	nr	nr	nr	nr
Soda Dam Main Spring	VA73	13.7	8.50	5.60	48	1.2	nr	nr	nr	nr
Soda Dam Main Spring	VA89	nr	nr	5.46	nr	nr	nr	nr	nr	nr
Soda Dam Main Spring	VA99	nr	14.10	6.00	nr	nr	nr	nr	nr	nr
Soda Dam Main Spring	VA109	12.7	15.70	4.07	47	1.39	nr	nr	nr	nr
Soda Dam Main Spring	VA132	15.8	13.90	4.60	42	1.4	nr	nr	nr	nr
Soda Dam Main Spring	VA140	13.8	12.10	4.60	47	2.84	nr	nr	nr	nr
Soda Dam Main Spring	VA146	nr	nr	4.60	46	nr	nr	nr	nr	nr
Hidden Warm Spring	VA27	10.8	10.60	nr	44	1.9	nr	nr	nr	nr
Hidden Warm Spring	VA90	nr	nr	4.11	nr	nr	nr	nr	nr	nr
Hidden Warm Spring	VA110	10.5	13.40	3.27	43	1.34	nr	nr	nr	nr
Hidden Warm Spring	VA141	11.1	10.60	3.80	43	2.55	nr	nr	nr	nr
Grotto Spring	VA-5	13.20	11.60	nr	38	nr	nr	nr	nr	nr
Main Spring H-6	na	13.00	12.50	6.90	50	nr	nr	nr	nr	nr

Jemez Springs

Jemez Springs	LC16-JS-1	10.11	7.631266	3.565899	41.94321	0.521219	nr	nr	nr	nr
Main Jemez Spring	VA10	10.1	7.90	nr	93	0.56	nr	nr	nr	nr
Main Jemez Spring	VA18	9	8.00	nr	85	0.6	nr	nr	nr	nr
Main Jemez Spring	VA93	nr	nr	2.86	nr	nr	nr	nr	nr	nr
Main Jemez Spring	VA122	6.8	7.11	2.2	91	0.57	nr	nr	nr	nr
Main Jemez Spring	VA143	8.4	6.40	2.7	91	1.18	nr	nr	nr	nr
Main Jemez Spring	VA147	nr	5.18	3.9	90	nr	nr	nr	nr	nr
Jemez Springs geothermal well	VA121	6.8	7.11	2.2	89	67	nr	nr	nr	nr
Jemez Springs geothermal well	VA144	8.5	6.50	2.6	94	1.22	nr	nr	nr	nr
Jemez Well/24m	VA19	6.96	6.10	nr	70	0.54	nr	nr	nr	nr
Jemez Well/24m	VA25	8.4	6.80	nr	79	0.86	nr	nr	nr	nr
Jemez Well/152m	VA15	2.27	2.20	nr	24	0.4	nr	nr	nr	nr
Jemez Well/152m	VA21	3.6	2.50	nr	36	0.4	nr	nr	nr	nr
Jemez Spring Well	H-17	7.80	7.40	3.00	nr	nr	nr	nr	nr	nr
Travertine Mound Spring	VA7	8.2	7.80	nr	93	0.6	nr	nr	nr	nr

Travertine Mound Spring	VA17	8.46	7.90	nr	83	0.54	nr	nr	nr	nr
Travertine Mound Spring	VA66	9	7.00	2.6	92	0.59	nr	nr	nr	nr
Travertine Mound Spring	VA71	8.7	7.19	2.8	92	0.337	nr	nr	nr	nr
Travertine Mound Spring	VA91	nr	nr	3.01	nr	nr	nr	nr	nr	nr
Travertine Mound Spring	VA123	6.1	7.02	2.3	90	0.57	nr	nr	nr	nr
Travertine Mound Spring	VA142	8.6	6.70	2.7	92	1.22	nr	nr	nr	nr
Travertine Mound Spring	H-14	8.70	7.40	4.80	nr	nr	nr	nr	nr	nr
Buddhist Spring	VA-16	6.06	5.70	nr	72	0.52	nr	nr	nr	nr
Indian Springs										
Jemez Pueblo Well	LC16-JP-1	7.271266	7.69	4.24994	17.7757	2.58866	nr	nr	nr	nr
Indian Spring (hot) 1		4.00	nr	nr	nr	2.48	nr	nr	nr	nr
Indian Spring (hot) 2		4.40	nr	nr	nr	2.29	nr	nr	nr	nr
Jemez River										
East Fork Jemez River	EFJR	nr	nr	nr	nr	nr	nr	nr	nr	nr

Values are reported in ppm, nr – not reported

Table S5 – Sr and SO₄

Spring Name	Sample #	Sr ppm	⁸⁷Sr/⁸⁶Sr	SO₄ ppm	Source
Tierra Amarilla					
North Highway	McG-NH_4	5.910	0.719369	1415.9	This study
Twin Mound East	McG-TME_4	10.489	0.718548	2906.4	This study
High Mound	McG_HM_4	14.588	0.717798	3914.3	This study
Grassy Spring	McG_GS_4	19.397	0.716923	4362.4	This study
North Highway	VA-194	4.590	0.719397	1700.0	Vuataz et al., 1988
Penasco springs					
PS09	JRPS09	7.944	0.720044	1598.2	This study
PS23	PS24	8.911	0.717811	3370.4	This study
Kasemen Well	VA-195	7.740	0.715564	2800.0	Vuataz et al., 1988
Valles Caldera					
Baca 13	Baca 13	0.140	0.708423	1907.0	Vuataz et al., 1988
Baca 15	Baca 15	0.130	0.709412	2115.0	Vuataz et al., 1988
VC-1 core hole	VA-209	1.160	0.71522	945.0	Vuataz et al., 1998
VC-1 core hole	VA-238	0.760	0.715398	413.0	Vuataz et al., 1988
Spence hot spring	VA-190	0.030	0.708453	8.3	Vuataz et al., 1988
Woman bathhouse spring	VA-186	0.140	0.710614	1.5	Vuataz et al., 1988

Soda Dam springs					
Soda Dam Main spring	SDS	1.634	0.721982	38.0	This study
Soda Dam Main spring	LC16-SDS-1	1.522	0.722084	34.1	This study
Soda Dam Main spring	VA-191	1.270	0.721932	1500.0	Vuataz et al., 1988
Jemez Springs					
Jemez Springs	LC16-JS-1	0.569	0.722223	34.9	This study
Jemez Springs	JS_BH	0.573	0.721739	35.2	This study
Main JS	VA-192	0.510	0.721742	844.0	Vuataz et al., 1988
Indian Springs					
Jemez Pueblo Well	LC16-JP-1	2.900	0.723217	164.6	This study
Jemez River					
Jemez River above Soda Dam	JRABR	0.095	0.70971	8.6	This study

Table S6 – He and CO₂

Spring name	Sample #	Latitude	Longitude	Temp (° C)	R/R _A	R _C /R _A	Distance from Sulfur Springs	log R _C /R _A	d ¹³ C	Source
Tierra Amarilla										
Twin Mound East	LC07-SY-1	35.53674	-106.84757	25	nr	0.2	46.3	-0.8	-8.71	Karlstrom et al., 2013
Grassy Spring	na	35.51618	-106.84398	21.6	nr	0.2	48.2	-0.7	-4.6	Newell et al., 05
North Highway	LC10-NM-SY-North	35.54715	-106.82679	15.2	0.3	0.3	44.4	-0.6	-6.5	Karlstrom et al., 2013
North Highway	C-Spr	35.60657	-106.88540	nr	0.3	nr	41.5	-0.5	-5.25	Goff and Janik, 2002
Penasco springs										
Zia Hot Well (Kasemen Well)	Zia Hot Well	35.64555556	-106.8883333	nr	0.23	0.25	38.22	-0.6	-6.77	Goff and Janik, 2002
Penasco Springs	LC14-NM-PS-22	35.59008567	-106.8658911	29	0.19	0.19	41.98	-0.7	-6.7	This paper
Valles Caldera										
Womens bathhouse	na	35.906420	-106.616397	88.0	6.2	nr	1.0	0.8	-3.60	Goff and Janik, 2002
Sulfur Footbath Spring	na	35.908045	-106.615599	20	5.2	nr	1.0	0.7	-2.47	Goff and Janik, 2002
VC-2a well	na	35.907595	-106.615534	210.0	5.0	nr	1.0	0.7	-4.95	Goff and Janik, 2002
VC-2b well	na	35.91013	-106.60949	295	5.7	nr	1.0	0.8	-3.30	Goff and Janik, 2002
Baca well 13	na	35.896512	-106.568831	nr	4.8	nr	4.4	0.7	-4.510	Truesdell and Janik, 1986
Baca well 4	na	35.888989	-106.571063	nr	3.9	nr	4.5	0.6	-4.730	Truesdell and Janik, 1986

Baca well 24	na	35.885825	-106.581993	nr	3.4	nr	3.9	0.5	(-4.80)(-5.23)	Truesdell and Janik, 1986
Baca well 15	na	35.893188	-106.580717	nr	4.1	nr	3.6	0.6	(-4.77)(-10.96)	Truesdell and Janik, 1986
Soda Dam Springs										
Soda Dam Hot Spring	na	35.791681	-106.686041	46.9	0.8	nr	14.4	-0.1	-4.9	Goff and Janik, 2002
Jemez Springs										
Jemez, Hot Springs	na	35.77198	-106.69011	74.0	1.3	nr	16.6	0.1	-5.15	Goff and Janik, 2002
Indian Spring										
Jemez, Upper Owl Spring	na	35.62885	-106.76288	nr	nr	0.4	33.7	-0.4	nr	Newell et al., 05
Jemez, Salt Spring	na	35.59775	-106.76047	nr	nr	0.1	36.9	-0.9	nr	Newell et al., 05

nr – not reported